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Hydrogen sulfide and transcription factor Pax6 are involved in reparative neurogenesis of brain after mechanical injury of eyes in adult trout *Oncorhynchus mykiss*

Reparative proliferation and neurogenesis in the brain integrative centers after mechanical eye injury in an adult trout *Oncorhynchus mykiss* have been studied. We have found that proliferation and neurogenesis in proliferative brain regions, cerebellum, and optic tectum were significantly enhanced after the eye injury. One week after the injury, PCNA-positive radial glia cells have been identified in the tectum. IHC localization of cystathionine β -synthase and the Pax6 in cerebellum, tectum, telencephalon, diencephalon, midbrain and brainstem of *O. mykiss* were identified. Quantification of CBS and Pax6 expression was performed by ELISA and western blot analysis. Intense labeling of Pax6 was found in the radial glia cells of tectum, telencephalon and visual projections of diencephalon, midbrain tegmentum and brainstem. It was found that as a result of trauma to the eye undifferentiated cells forming neurogenic niches arise in the tectum, cerebellum, and brainstem. The differentiation of neuronal cells detected by labeling cells with antibodies against the protein HuC/D occurred in the proliferative zones of the telencephalon, the optic tectum, cerebellum, and medulla of a trout within 2 days after the injury. Our observations suggest that as a result of an eye injury in the different centers of the brain (primarily containing visual projections) proliferative response and strengthen the processes of neurogenesis in the secondary matrix areas of brain, and there are additional radial glia cells expressing Pax6 and hydrogen sulfide in different parts of the brain occurs. We suggest that the hydrogen sulfide is a factor of neuroprotection involved in reparative neurogenesis.

Biography

E V Pushchina has completed her PhD from Far East State University and Post-doctoral studies from A.V. Zhirmunsky Institute of Marine Biology. She is a Professor at RAS and Lead Researcher of Laboratory Citophysiology of IMB FEB RAS, a premier organization of National Centre of Marine BioResearch RAS. She has published more than 35 papers in reputed journals and has been serving as an Editorial Board Member of repute.

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